

**IN THE ABSTRACT:**

The previously submitted abstract has been amended as set forth below. A clean version of the amended abstract is being submitted herewith on a separate sheet.

**Amended Abstract**

A method of cross-sectional processing and observation comprises a first step of processing at least one predetermined area in a surface of a sample to form a target ~~cross-section~~, and cross-section by etching the at least one predetermined area with a focused energy beam using a focused energy beam irradiating unit in a vacuum chamber. The method further comprises a second step of observing the target cross-section by scanning the target cross-section with a probe of a scanning probe microscope in the vacuum chamber and detecting a physical quantity produced between the probe and the target cross-section.